# (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

### (19) World Intellectual Property Organization

International Bureau

## (43) International Publication Date 18 November 2004 (18.11.2004)



# 

## (10) International Publication Number WO 2004/099324 A2

(51) International Patent Classification7: E01F 9/04, C08K 3/00

C09D 5/00,

(21) International Application Number:

PCT/US2004/009554

- (22) International Filing Date: 29 March 2004 (29.03.2004)
- (25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 2003-107743

11 April 2003 (11.04.2003)

- (71) Applicant: 3M INNOVATIVE PROPERTIES COM-PANY [US/US]; 3M Center, Post Office Box 33427, Saint Paul, MN 55133-3427 (US).
- (72) Inventors; and
- Inventors/Applicants (for US only): NAGAOKA,

- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD. MG, MK, MN, MW, MX, MZ, NA, NT, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(73) Inventors; and (75) Inventors; Applicants (for US only): NAGAOKA, Yoshiyuki (IP/IP); 4-26-4, Midori-cho, Yamagata, Yamagata 990-2428 (IP). MIZUFUNE, Kanya [IP/IP]; 1-8-4, Higashihara-cho, Yamagata, Yamagata 990-0034 (IP).

(74) Agents: LILLY, James, V. et al.; Office of Intellectual Property Counsel, Post Office Box 33427, Saint Paul, MN 55133-3427 (US).

(75) Abstract: A marking material for use on a surface, the marking material including a binder material and a thermal-sensitive pigment. The marking material undergoes an irreversible color change from the first color to a second color. The second color color and to be republished:

without international search report and to be republished upon receipt of that report

without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guid-ance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette. pigment. The marking material exhibits a first color different from a surface color. Upon being heated to a temperature of at least about 70°C, the marking material undergoes an irreversible color change from the first color to a second color. The second color renders the marking material effectively invisible to an observer. A marker and a method of using the marker are also disclosed.

